## REMARKS

Applicants respectfully provide a listing of related issued U.S. Patents and pending U.S. Applications for consideration by the Examiner. Applicants also provide a Table (see attached) listing the relevant information regarding each of the related U.S. Patents and pending U.S. Applications.

| Appl. No. | Filing Date | Other Information |
|---|---|---|
| 08/749,164 | 11/14/96 | U.S. Patent No. 5,910,306 |
| 08/896,085 | 07/17/97 | U.S. Patent No. 5,980,898 |
| 09/257,188 | 02/25/99 | U.S. Patent No. 6,797,276 |
| 09/266, 803 | 03/12/99 | Pending |
| 09/337,746 | 06/22/99 | Pending |
| 10/435,676 | 05/12/03 | Pending |
| 10/467,887 | 03/22/04 | Pending |
| 10/472,393 | 05/13/04 | Pending |
| 10/472,598 | 03/12/04 | Pending |
| 10/633,626 | 08/05/03 | Pending |
| 10/658,418 | 09/10/03 | Pending |
| 10/790,715 | 03/03/04 | Pending |
| 10/798,948 | 03/12/04 | Pending |
| 10/895,323 | 07/21/04 | Pending |
| 11/007,282 | 12/09/04 | Pending |
| 11/109,948 | 04/20/05 | Pending |
| 11/141,690 | 06/01/05 | Pending |
| 11/143,942 | 06/03/05 | Pending |

Conclusion

The foregoing amendments and remarks are being made to place the application in condition for allowance. Applicants respectfully request reconsideration and the timely allowance of the pending claims. A favorable action is awaited. If, in the opinion of the

Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the telephone number provided below.

If there are any additional fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. §1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,
**Morgan, Lewis & Bockius LLP**

Sally P. Teng, Ph.D.
Registration No. 45,397

Date: August 31, 2005
Morgan, Lewis & Bockius LLP
Customer No. **009629**
1111 Pennsylvania Ave., N.W.
Washington, D.C. 20004
202.739.3000

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## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
|---|---|---|---|---|---|---|
| **08/749,164** | 056707-5002 | 11/14/1996 (11/14/1996) | U.S. Patent No. 5,910,306 | Carl R. Alving Gregory M Glenn | The Government of the United States, as Represented by the Secretary of the Army | 1. A method of inducing an immune response to an antigen comprising:<br>(a) applying a formulation to intact skin of an organism, wherein the formulation comprises liposomes and the antigen; and<br>(b) inducing the immune response in the organism without perforating the skin, wherein the immune response is specific for the antigen. |
| **08/896,085** | 056707-5002-02 | 7/17/1997 (11/14/1996) | U.S. Patent No. 5,980,898 | Gregory M Glenn Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 1. A patch for transcutaneous immunization comprising:<br>(a) a dressing, said dressing being configured to cause hydration of intact skin;<br>(b) an immunizing antigen, and<br>(c) an adjuvant; whereby application of the patch to said intact skin induces an immune response specific for said immunizing antigen. |
| **09/257,188** | 056707-5001 | 2/25/1999 (11/14/1996) | U.S. Patent No. 6,797,276 | Gregory M Glenn Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 1. A method for inducing an antigen specific immune response in a subject comprising:<br>a. pretreating an are of the skin of said subject; and<br>b. applying a formulation to said pretreated area, wherein said formulation comprises:<br>1) at least one antigen sufficient to induce an antigen-specific immune response against a pathogen,<br>2) at least one adjuvant present in an amount effective to induce said immune response to said at least one antigen; and,<br>3) a pharmaceutically acceptable carrier, wherein said pretreating enhances skin penetration by said formulation and thereby induces said immune response,<br>wherein said pretreating is selected from the group consisting of direct application to said skin, rubbing, swabbing, applying a depilatory agent, applying a keratinolytic formulation, shaving, tape stripping, abrading |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | | and a combination thereof. |
| **09/266,803** | 056707-5002-03 | 3/12/1999 (11/14/1996) | Pending | Gregory M Glenn Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 112. A method of inducing an immune response to at least one antigen comprising applying a formulation to hydrated skin of an organism, wherein the formulation comprises (i) at least one antigen which is derived from a pathogen and (ii) at least one adjuvant, wherein an effective amount of the at least one antigen induces the immune response to the at least one antigen in the organism.<br><br>135. A method of inducing an immune response to at least one antigen comprising applying a formulation to skin of an organism, said formulation comprising (i) at least one antigen derived from a pathogen; and, (ii) at least one adjuvant, wherein said formulation does not comprise transferosomes; wherein said formulation is hydrated such that delivery of an effective amount of said antigen occurs, wherein said effective amount of said antigen induces said immune response. |
| **09/337,746** | 056707-5003 | 6/22/1999 (6/22/1998) | Pending | Gregory M Glenn Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 71. A method for inducing an antigen-specific immune response in an organism comprising: (a)providing a formulation comprising a molecule is selected from the group consisting of ADP-ribosylating exotoxins[,] B subunits of ADP-ribosylating exotoxins and mixtures thereof; and, (b)applying said formulation to skin of the organism without penetrating through said skin's dermis layer, wherein said formulation is hydrated such that delivery of an effective |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | | amount of said formulation occurs, wherein said effective amount of said formulation induces said antigen-specific immune response in said organism.<br><br>102. A method for inducing an antigen-specific immune response in an organism comprising:<br>(a)providing a formulation consisting essentially of a molecule selected from the group consisting of ADP-ribosylating exotoxins, B subunits of ADP-ribosylating exotoxins and mixtures thereof; and,<br>(b)applying said formulation to skin of said organism without penetrating through said skin's dermis layer, wherein said formulation is hydrated such that delivery of an effective amount of said formulation occurs, wherein said effective amount of said formulation induces said antigen-specific immune response in said organism. |
| **10/435,676** | 056707-5012 | 5/12/2003 (5/10/2002) | Pending | Gregory M. Glenn<br>Larry R. Ellingsworth<br>Scott A. Hammond | Iomai Corporation | 1. A method of transcutaneous immunostimulation comprising: (a) providing a subject in need of immunization with a vaccine, (b) applying at least one adjuvant epicutaneously to the subject's skin, and (c) immunizing the subject with the vaccine by a route of administration other than transcutaneous, wherein the vaccine comprises one or more antigens; whereby the at least one adjuvant causes transcutaneous immunostimulation by inducing an immune response specific for the one or more antigens, wherein the immune response stimulated by the at least one adjuvant is more effective than in the absence of the at least one adjuvant.<br><br>17. A method of potentiating an immune response in a subject comprising: (a) administering to the subject an antigen-containing formulation comprising at least one |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | | antigen sufficient to induce an antigen-specific immune response; and (b) applying a separate adjuvant-containing formulation to an area of skin of the subject, wherein the adjuvant-containing formulation comprises at least one adjuvant present in an amount effective to potentiate the antigen-specfic immune response.<br><br>19. A method of potentiating an immune response in a subject comprising: (a) administering antibody to the subject as immunotherapy, wherein the immunotherapy is sufficient to induce an immune response; and (b) applying a separate adjuvant-containing formulation to an area of skin of the subject, wherein the adjuvant-containing formulation comprises at least one adjuvant present in an amount effective to potentiate the immune response. |
| **10/467,887** | 056707-5011 | 3/22/2004 (2/13/2001) | Pending | Gregory M. Glenn<br>Frederick J. Cassels | The Government of the United States, as Represented by the Secretary of the Army | 1. An immunogen for transcutaneous immunization, wherein said immunogen is comprised of one or more antigens in effective amounts to induce an immune response against one or more strains of enterotoxigenic *Escherichia coli* (ETEC). |
| **10/472,393** | 056707-5014 | 5/13/2004 (3/19/2001) | Pending | Gregory M Glenn<br>Howard R Six | Iomai Corporation | 1. A method of transcutaneous immunostimulation comprising:<br>(a)providing a subject in need of immunization with a vaccine,<br>(b)applying at least one adjuvant epicutaneously to the subject's skin, and<br>(c)immunizing the subject with the vaccine by a route of administration other than transcutaneous, wherein the vaccine comprises one or more antigens;<br>whereby at least one adjuvant causes transcutaneous immunostimulation by inducing an immune response |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | | specific for one or more antigens, wherein the immune response stimulated by the at least one adjuvant is more effective than in the absence of the at least one adjuvant.<br><br>18. A method of inducing an immune response specific for one or more antigens comprising:<br>(a)providing a subject in need of immunization with a vaccine,<br>(b)applying at least one adjuvant epicutaneously to the subject's skin, and<br>(c)immunizing the subject with the vaccine by a route of administration other than transcutaneous, wherein the vaccine comprises one or more antigens;<br>whereby the at least one adjuvant causes transcutaneous immunostimulation by inducing an immune response specific for the one or more antigens, wherein the immune response stimulated by the at least one adjuvant is more effective than in the absence of the at least one adjuvant. |
| **10/472,598** | 056707-5013 | 3/12/2004 (3/19/2001) | Pending | Gregory M. Glenn<br>Jianmei Yu<br>Mervyn L. Hamer<br>Jesus Miranda<br>Christopher L. Adams | Iomai Corporation | 1. A patch for transcutaneous immunization comprising at least four different components:<br>(a)a backing layer,<br>(b)a pressure-sensitive adhesive layer adhering to the backing layer, and an immunogenic formulation applied to and/or incorporated in the pressure-sensitive adhesive layer comprising:<br>(c)at least one protein in contact with adhesive of the pressure-sensitive adhesive layer, wherein the at least one protein is immunologically active and<br>(d)a stabilizer which maintains the immunological activity of the at least one protein in the adhesive's presence;<br>wherein the patch is epicutaneously applied to a subject's skin with the pressure-sensitive adhesive layer adhering to |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | | the skin and the backing layer distal thereto, such that an effective amount of the at least one protein induces an antigen-specific immune response in the subject by transcutaneous immunization.<br><br>24. A formulation comprising (a) pressure-sensitive adhesive, (b) immunogen comprising at least one immunologically-active protein, and (c) stabilizer which maintains the immunological activity of the at least one protein in a suspension or solution with the pressure-sensitive adhesive. |
| **10/633,626** | 056707-5009-01 | 8/5/2003 (4/8/1999) | Pending | Gregory M Glenn<br>Tanya Scharton-Kersten | Iomai Corporation | 2. A method of inducing an immune response comprising applying a formulation to intact dry skin of a subject, wherein the formulation is comprised of at least one antigen and at least one adjuvant wherein the formulation is applied in dry form; and wherein the formulation is applied in an amount and for a length of time effective to induce an immune response specific for the at least one antigen.<br><br>38. A method of inducing an immune response comprising applying a dry formulation to dry skin of a subject, wherein the dry formulation comprises antigen and adjuvant as active ingredients, in an amount and for a time sufficient to induce a systemic or regional immune response, or both, specific for the antigen. |
| **10/658,418** | 056707-5005-01 | 9/10/2003 (6/3/1999) | Pending | Gregory M Glenn<br>Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 1. A method for inducing an antigen specific immune response in a subject comprising applying a formulation to the skin of a subject, wherein said formulation comprises:<br>a) at least one antigen derived from a pathogen,<br>b) at least one adjuvant present in an amount effective to induce said immune response to said at least one antigen; |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | | c) a pharmaceutically acceptable carrier; and,<br>d) a marking formulation comprising at least one chemical indicator,<br>wherein said adjuvant induces said antigen specific immune response in said subject, and wherein the presence of said chemical indicator is a readily discernable indication of the use of said formulation. |
| **10/790,715** | 056707-5001-01 | 3/3/2004 (11/14/1996) | Pending | Gregory M Glenn<br>Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 71. A method for inducing an antigen-specific immune response in a subject comprising:<br>a) pretreating an area of the skin of said subject; and<br>b) applying a formulation to said pretreated area, wherein said formulation comprises:<br>1) at least one antigen sufficient to induce an antigen-specific immune response;<br>2) at least one adjuvant present in an amount effective to induce said immune response to said at least one antigen; and,<br>3) a pharmaceutically acceptable carrier;<br>wherein said pretreating enhances said immune response.<br><br>86. A method for inducing an antigen-specific immune response in a subject comprising concurrently<br>a) treating an area of the skin of said subject; and<br>b) applying a formulation to said treated area, wherein said formulation comprises:<br>1) at least one antigen sufficient to induce an antigen-specific immune response;<br>2) at least one adjuvant present in an amount effective to induce said immune response to said at least one antigen; and,<br>3) a pharmaceutically acceptable carrier;<br>wherein said treating enhances said immune response. |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | | 94. A method for inducing an antigen-specific immune response in a subject comprising:<br>a) applying a first formulation comprising at least one antigen at an area of the skin of said subject; and<br>b) applying a second formulation comprising at least one adjuvant at the same or different area of the skin as the first formulation, thereby inducing an antigen-specific immune response;<br>wherein said formulations are applied epicutaneously or by disrupting only the outer surface of said area of the skin. |
| **10/798,948** | 056707-5016 | 3/12/2004 (11/25/2002) | Pending | Adam S. Lambert<br>Gregory M. Glenn<br>Larry R. Ellingsworth | Iomai Corporation | 1. A device for delivery of at least one protein to an antigen presenting cell of skin, wherein said device is comprised of:<br>(a)a plurality of protrusions, wherein the protrusions are adapted at their distal ends to deliver the at least one antigen and/or adjuvant to the antigen presenting cell;<br>(b)an immunogenic formulation on at least some portion of the distal end of the protrusions, wherein the immunogenic formulation comprises:<br>(i)an adhesive,<br>(ii)the at least one protein in contact with the adhesive, wherein the at least one protein has immunological activity, and<br>(iii)a stabilizer which maintains the immunological activity of the at least one protein in the adhesive's presence;<br>wherein said device is epicutaneously applied to the skin of a subject such that an effective amount of the at least one protein induces an immune response and/or stimulates an existing immune specific for antigen in the subject. |
| **10/895,323** | 056707-5004-02 | 7/21/2004 (11/14/1996) | Pending | Gregory M Glenn<br>Carl R. Alving | The Government of the United States, as Represented by the | 70. A method for a single and immediate delivery of a substance to the epidermal tissue of skin comprising simultaneously disrupting only the stratum corneum but not |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| | | | | | Secretary of the Army | the epidermis of the skin and delivering the substance to the epidermal tissue of the skin.<br><br>88. A device for delivering a substance into skin comprising an abrading surface coated with the substance and a reservoir containing a reconstituting liquid in fluid communication with the abrading surface. |
| **11/007,282** | 056707-5007 | 12/9/2004 (12/9/2003) | Pending | Paul Zoeteweij<br>Gregory M. Glenn<br>Larry R. Ellingsworth | Iomai Corporation | 1. A method of inducing an antigen-specific immune response to one or more antigens in a subject in need thereof comprising administering a first formulation comprising at least one GM-1 binding deficient exotoxin and a second formulation comprising at least one antigen, in an amount sufficient to induce said antigen-specific immune response in said subject, wherein said administering is selected from the group consisting of intradermal, intramuscular, subcutaneous and topical.<br><br>6. A method of inducing an antigen-specific immune response to one or more antigens in a subject in need thereof comprising administering a formulation comprising at least one GM-1 binding deficient exotoxin and at least one antigen, in an amount sufficient to induce said antigen-specific immune response in said subject, wherein said administering is selected from the group consisting of intradermal, intramuscular, subcutaneous and topical.<br><br>8. A method of inducing an immune response in a subject in need thereof comprising administering at least one GM-1 binding deficient exotoxin in an amount sufficient to induce said immune response in said subject, wherein said administering is selected from the group consisting of intradermal, intramuscular, subcutaneous and topical. |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| **11/109,948** | 056707-5004-03 | 4/20/2005 (11/14/1996) | Pending | Gregory M Glenn<br>Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 1. A method for transcutaneous immunization comprising:<br>(a)providing a formulation comprised of at least one antigen and at least one adjuvant,<br>(b)applying said formulation epicutaneously to skin of an organism without penetrating past dermis of said skin, and<br>(c) inducing an antigen-specific immune response in said organism.<br><br>80. A method for transcutaneous immunization of an organism comprising:<br>(a)providing a formulation comprised of at least one antigen and at least one adjuvant, wherein enhancement of immunologic activity by said adjuvant is separable from an immunogenic epitope of said antigen;<br>b)applying said formulation to skin of said organism; and<br>(c) inducing an immune response in said organism specific for said immunogenic epitope which is enhanced as compared to a formulation that does not contain said adjuvant activity.<br><br>93. A formulation which comprises:<br>(a) at least one antigen, and<br>(b) at one adjuvant;<br>wherein enhancement of immunologic activity by said adjuvant is separable from an immunogenic epitope of said antigen, and said formulation induces an immune response specific for said immunogenic epitope which is enhanced as compared to a formulation that does not contain said adjuvant activity. |

## Related Patents and Pending Applications

| Application No. | Attorney Docket No. | Filing Date (Earliest Priority Date) | Status | Inventor | Assignee | Independent Claims |
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| **11/141,690** | 056707-5003-01 | 6/1/2005 (6/22/1998) | Pending | Gregory M Glenn<br>Carl R. Alving | The Government of the United States, as Represented by the Secretary of the Army | 1. A method for transcutaneous immunization comprising: (a)providing a formulation comprised of at least one molecule which is an antigen or a polynucleotide encoding said antigen, wherein said formulation does not include heterologous adjuvant;<br>(b)applying said formulation epicutaneously to skin of an organism without penetrating said skin's dermis layer; and<br>(c) inducing an antigen-specific immune response in said organism, wherein at least one epitope of said antigen is recognized. |
| **11/143,942** | 056707-5009-03 | 6/3/2005 (4/8/1999) | Pending | Gregory M Glenn<br>Tanya Scharton-Kersten | Iomai Corporation | 46. A method of inducing an immune response comprising applying a formulation to skin of a subject, wherein the formulation is comprised of at least one antigen and at least one adjuvant wherein the formulation is applied in dry form; and wherein the formulation is applied in an amount and for a length of time effective to induce an immune response specific for the at least one antigen.<br><br>58. A method of inducing an immune response comprising applying a dry formulation to skin of a subject, wherein the dry formulation comprises antigen and adjuvant as active ingredients, in an amount and for a time sufficient to induce a systemic or regional immune response, or both, specific for the antigen. |